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DOI: https://doi.org/10.1007/s10578-011-0259-9

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Parental Separation and Child Aggressive and Internalizing Behavior: An Event History Calendar Analysis

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We would like to acknowledge financial support from the Swiss National Science Foundation, the Jacobs Foundation, the Swiss Federal Office of Public Health, the Canton of Zurich Ministry of Education, and the Julius Baer Foundation. We would like to thank the editor and reviewers for their helpful comments.

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Abstract

This study investigated the relationship between parental separation and aggressive and internalizing behavior in a large sample of Swiss children drawn from the ongoing Zurich Project on the Social Development of Children and Youths. Parents retrospectively reported life events and problem behavior for the first 7 years of the child's life on a quarterly basis (*N* = 995; 28,096 time points) using an Event History Calendar. The time sequences of separation and child problem behavior were analyzed. Parental separation affected both aggressive and internalizing behavior even when maternal depression, financial difficulties, and parental conflict were included. Parental separation exerted a direct effect on child problem behavior as well as an indirect effect via maternal depression.

Keywords: Parental Separation; Aggressive Behavior; Internalizing Behavior; Children; Event History Calendar.

Trial registry name: The Zurich Project on the Social Development of Children and Youths

Identification number: ISRCTN84472990

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Both in popular belief and in the social sciences, parental separation is often seen as a cause or contributing factor to depression and aggressive problem behavior in children, as well as later delinquency. Several prior studies have shown that youth delinquents are more likely than their noncriminal peers to come from "broken homes" and to have faced parental separation [1, 2]. Children and adults suffering from depression and anxiety are more likely than those who do not suffer from depression and anxiety to come from broken homes [3, 4]. Although these and other studies suggest a direct effect of parental separation on problem behavior, several issues remain unresolved.

First, most previous work has focused on comparisons between, instead of within, individuals [5]. Although these studies have yielded valuable findings, they are beset by possible selection bias. For example, children from broken homes may share characteristics that, even though not influenced by the separation itself, still increase the propensity for problem behavior. Therefore, in the present study, we collected measurements of problem behavior that retrospectively assessed the periods before and after the separation, because we were interested in how much problem behavior increases following separation. We utilized multilevel models that allowed us to focus only on the changes that occurred within individuals. Second, we tested the validity of three key explanations proposed in the developmental and sociological literature to account for the link between parental separation and child problem behavior: maternal depression, financial problems, and parental conflict [6]. We are not aware of studies addressing these three explanations simultaneously. Third, we used a large sample of children from Switzerland to assess the relationship between separation and problem behavior during the first 7 years of the child's life.

We also introduced a novel test instrument, the Event History Calendar (EHC), which

allowed us to investigate the specific time sequence of separation and child problem behavior. To the best of our knowledge, ours is the first study to use this methodology to test the relationship between separation and problem behavior. Our study was thus well suited to fill some of the research gaps on the effects of parental separation on children's aggressive and internalizing problem behavior. In our study, we defined parental separation as the permanent departure of one of the (previously) married or cohabitating parents who lived with the child at birth. Although in most cases this parent is biologically related to the child, this does not always need to be the case.

Parental Separation and Children's Aggressive and Internalizing Problem Behavior

Numerous studies on the effects of parental separation on child problem behavior have been conducted. Existing studies have been summarized in two large meta-analyses. In their meta-analysis of 92 studies, Amato and Keith [4] revealed that the mean effect sizes for children from divorced families were 0.23 standard deviations lower for conduct and 0.08 lower for psychological adjustment than for children from intact families. The effects for child conduct (but not psychological adjustment) were significant only if the assessment occurred within two years of the divorce. In an update of the meta-analysis, Amato [3] reported approximately the same results for conduct, but the effect sizes for psychological adjustment were larger than before. In both studies, the authors found variation in the effect sizes across studies that they attributed to sample differences.

Although most previous studies examining the effects of separation on child problem behavior utilized cross-sectional data, a number of recent studies collected data at multiple measurement times. The latter are generally better able to control for selection bias than cross-sectional studies. These studies found that parental separation increased behavior problems in midchildhood and (pre-) adolescence [7–10], although another study failed to find effects [11]. The time of parental separation is important: separation has been found to increase

internalizing behavior in children primarily during the first 2 years after the divorce [12]. Most of these studies examined the effects of parental separation on behavior in midchildhood, adolescence, or adulthood. However, effects have been shown to be particularly adverse for younger children, presumably because younger children are more dependent on their parents, have less extra-familial support structures, and are in a more formative state of development [13–15]. Two longitudinal studies among younger children aged 4 through 7 years indeed found effects of parental separation on behavior problems, although these effects may be stronger in boys than in girls [16] and may be found only for anxiety and depression, but not antisocial behavior [5]. Interestingly, the latter study found that compared to children from intact homes, children with divorced parents already had higher levels of internalizing and antisocial behavior prior to the divorce. Similarly, another study found that most of the variation in child behavior was not due to parental marital transitions, but to background characteristics of the child such as gender and ethnicity [17].

Although there are exceptions [5, 7, 11, 17], most studies that used multiple measurement times to investigate the relationship between parental separation and child problem behavior used only two measurement times. Studies using two times provide more robust results than cross-sectional studies, but they are still limited in the extent to which they can provide information on developmental processes before, during, and after separation. Thus, in the present study we obtained retrospective measurements of both parental separation and child behavior with multiple measurements that were administered close to one another in time.

The Role of Maternal Depression, Financial Difficulties, and Parental Conflict

In addition, the previous studies typically did not include the effects of key explanatory variables that may vary before, during, and after separation [6]. The effects of separation on child problem behavior can be mediated by maternal depression and financial difficulties. Furthermore, the effects of separation may not be due to the separation event itself, but due to

the parental conflict before separation. We aimed to overcome this limitation in the present study by collecting data on these three key variables.

First, the effect of separation on child problem behavior may be mediated by the postseparation psychological adjustment of the custodial parent, usually the mother. Prior research has documented that depression is associated with parental separation [18, 19], although the effect may be short-lived [20]. In turn, maternal stress and depression are associated with negative perceptions, reduced self-esteem with regard to one's caregiving abilities, and emotional distress [21]. These symptoms can affect the quality of the parent-child relationship and the well-being of the child, potentially leading to child problem behavior [22, 23]. Depression in mothers is also associated with emotional unavailability and intrusive and insensitive parenting, which promotes their children's insecure attachment and shapes their development of emotion regulation [21, 24, 25]. A disturbed development of emotion regulation can in turn lead to problem behavior in children [26]. In the longer term, it can also lead to excessive sensitization of children's arousal systems, making it more difficult for them to regulate the arousal in social situations and increasing the potential for maladjustment [24]. Thus, maternal depression around the time of separation is a form of psychological maladjustment that can mediate the effect of parental separation on child problem behavior.

Second, divorced or separated single parents (mothers in particular) often face economic hardship [27]. Because of these hardships, children find themselves in a low socioeconomic situation that increases the risk of problem behavior [6]. Prior research suggests that separation leads to reduced parental income, especially for the mother, at least in the short term [28]. During the first year of separation, the mother's income drops to 71% of its preseparation level [29]. After the second year of separation, the gender difference stabilizes, with the mothers' income averaging about 80% of the preseparation level and the fathers'

income averaging around 95%. Economic pressure is likely to lead to maternal depression and may impair divorced or separated mothers' role coping strategies, which in turn reduces parental control and positive parenting; the latter, in turn, may increase the likelihood of child problem behavior [30]. Thus, financial difficulties may be a key mediator in the association between separation and child problem behaviour.

Third, it has been argued that in families where the level of conflict and hostility between the parents was high, the well-being of the children was seriously damaged; there is abundant evidence supporting this conclusion [6]. Negative interactions and conflicts between partners are correlated with divorce potential [31]. In turn, parental conflict diverts attention away from the child and leads to ineffective parenting, while the hostility between parents may also transfer hostility, anger and tension into parent-child interactions [32]. Children have been shown to be very sensitive to conflict, showing higher levels of anger and distress in response [21]. Parental conflict has been found to increase internalizing and aggressive problem behavior in children [32–35]. It is expected that the association between separation and child problem behavior may be reduced after parental conflict is controlled for. In fact (although not specifically tested in the current analysis), it has been argued that the well-being of the child should *increase* after separation in situations of parental conflict [6]. Amato, Loomis, and Booth [36] found that family dissolution in situations of parental conflict indeed increased children's well-being. The authors interpreted this finding to mean that the impact of a potentially disruptive event depends on how much stress had accumulated *before* the event. Parental separation is thus likely to be less problematic, the more parental conflict the children experienced [5, 8, 9, 12, 37].

The Present Study

In the present study we used an Event History Calendar (EHC) to investigate the effects of parental separation on child aggressive and internalizing behavior in a sample of Swiss 7-

year-old children. The EHC retrospectively collected information on the occurrence of parental separation and problem behavior for each quarter of a year. EHCs are better at retrieving memory of important life events than traditional questionnaires, because they encourage the sequencing and parallel retrieval of the relevant events [38]. EHCs are especially suitable for eliciting information about transitions (e.g., separation, first job), because they enable researchers to collect information continually rather than just at one time [39]. Traditional longitudinal surveys provide only snapshots of information about one's life and do not necessarily tap into the time periods between the snapshots. Their capacity to provide information about the effects of time-varying conditions on behavior is therefore limited [40].

We addressed two research questions. First, what is the role of separation on child aggressive and internalizing behavior in the first 7 years of a child's life? Second, to what extent can the effect of separation on problem behavior in children be attributed to maternal depression, financial difficulties, and parental conflict? Based on previous research, we hypothesized that parental separation increases both aggressive and internalizing problem behavior. We expected that the effect of separation on child problem behavior would be mediated by maternal depression and financial difficulties. Furthermore, we tested whether these effects occurred after parental conflict before separation was included. The resulting path model is displayed in Figure 1.

Finally, we examined the role of gender in the relation between parental separation and child problem behavior because previous research has revealed modest evidence for gender differences in the effects of separation on problem behavior [3, 4].

Method

Participants

The data were drawn from an ongoing combined longitudinal and intervention study, the

Zurich Project on the Social Development of Children and Youths (*z-proso*) [41]. The target population is all 2,520 children who entered the first grade of one of the 90 public primary schools in Zurich, Switzerland, in 2004. Because the interventions occurred at the school level, a cluster randomized approach was used for the sampling. The schools were classified by enrollment size and the socioeconomic background of the school district. Subsequently, a stratified sample of 56 schools was drawn. Thus, the final sample consisted of all 1,675 children – as well as their parents and teachers – who started primary school in one of the 56 selected schools in 2004. A total of 1,225 parents (73% of the target sample) agreed to participate in the initial interview.

The sample was 52% male. The mean age of the children at the time of the child interview was 7.45 years (SD = 0.39). Eleven percent of the children were born outside of Switzerland, and in 46% of the cases both parents were born outside of Switzerland. All contact letters and parent interviews were translated into the nine languages most frequently spoken by the immigrant minorities. In terms of educational attainment of the parents, 24% had little to no secondary education, 32% had vocational training, 29% had attended vocational school or had earned a baccalaureate degree or advanced vocational diploma, and 16% had a university degree.

Measures

Event History Calendar (EHC). To measure study variables at 3-month intervals from birth to age 7, an EHC was given to the parents. The EHC is formatted as a large grid with rows and columns. The rows represent the patterns under investigation (e.g. family composition, problem behavior) and the columns represent the time periods for which they are recorded. In the present study each column represented a period of 3 months. The rows covered five main areas: residential history, household composition, external childcare, disruptive life events (e.g. maternal depression, financial difficulties, parental conflict), and child aggressive and

internalizing problem behavior. In EHCs, the most easily recalled themes are usually placed at the top, followed by the more difficult ones. For this study, the top row was place of residence, the bottom row was the child's behavior.

We located four studies that tested the accuracy of EHCs. Three are positive, and one is negative. To start with the last, Roberts and colleagues [42] compared EHC reports with prospective weekly self-reports of violent offending for an overlapping period of five months. The EHC interview took place 12 to 51 months after the initial weekly self-reports. In 59% of months did both data-sources elicit identical information. No effect of time passed since the administration of weekly self-reports was found on memory decay. The characteristics of the research subjects (suffering from potential cognitive impairments due to heavy substance abuse or mental health issues) were likely to have contributed to the poor results. Other studies have yielded much more promising results. First, Freedman et al. [43] compared 1980 reports from the regular interview about life history with the 1985 EHC retrospective report for the 1980 interview month. They found that identical answers were obtained in over 90% of marital and school reports, and in 72-83% of employment reports. Second, Caspi et al. [39] compared 1990 reports from a regular interview about current demographics (work, living arrangements, etc.) with the 1993 EHC retrospective reports about those same demographics during the 1990 interview month. The information from both data-sources was identical in over 90% of cases. Third, Morris and Slocum [44] compared retrospective arrest data from their EHC with official records among 351 incarcerated women. Sample characteristics included high substance abuse. The EHC covered the past three years prior to detention. In total 88% of women accurately reported the prevalence of arrest for the three years prior to detention. Approximately 55% of respondents were able to place their arrest in the exact month in which it occurred, increasing to 76% when a 2-month buffer was allowed. Respondents accurately identified 90% of months as 'arrest' or 'non-arrest' months.

Aggressive behavior. Parents were asked to rate their child on the EHC for periods during which the child had been particularly aggressive or defiant or had frequent temper tantrums and fights with other children. At least one instance of aggressive behavior was reported for 10.2% of the children (n = 125 of the total N of 1,225). For the total sample, the mean number of quarters during which the child behaved aggressively is 0.47 (SD = 2.18). For those children who were reported to have behaved aggressively during at least one quarter, the mean is 4.60 (SD = 5.28). In total, 3.8% of the children were reported to have exhibited aggressive behavior during the first 3 years, and 7.9% were reported to have exhibited aggressive behavior during the second 3 years.

Internalizing behavior. The parents were asked to rate their child on internalizing behavior for periods in which the child had been particularly sad or fearful, withdrew from others, or could not sleep. Nineteen percent of the children (n = 230) experienced at least one quarter with internalizing problems. For the total sample, the mean number of quarters in which internalizing behavior occurred was 1.01 (SD = 3.13). For the children who experienced internalizing problems in at least one quarter, the mean number of quarters was 5.37 (SD = 5.39). In total, 8% of the children experienced internalizing problems during the first 3 years, and 14.7% during the second 3 years.

Parental separation. This variable was defined on the EHC as the permanent departure by one of the parents who lived with the child at birth. Parental separation was experienced by 162 children (13.2%). In 161 cases, separation concerned the child's biological parents. Most children (96%) lived full time with the mother after separation.

Maternal depression. This variable was defined on the EHC as the mother feeling depressed for extended periods of time, being permanently unhappy, or feeling overburdened. Depression scores were recorded regardless of whether the interviewed parent was the mother or the father. However, because other- and self-report measures may be different, we analyzed

only the EHCs by the mothers. In 250 cases (20.4%), at least one quarter of maternal depression was reported. For the entire sample, the mean number of quarters during which maternal depression occurred was 1.48 (*SD* = 4.39). For those who experienced depression in at least one quarter, the mean number of quarters was 7.27 (*SD* = 7.25). Twelve percent of the respondents reported depression during the first 3 years, whereas 13.4% reported such a period during the second 3 years. This information was compared with information on perinatal depression obtained in the first wave of the *z-proso* study. This comparison demonstrates convergent validity for the EHC, as mothers who indicated perinatal depression when the child was born were much more likely than other mothers to also report depression during the first 3 years (*OR* = 6.46, $p < .001$) and the second 3 years (*OR* = 3.18, $p < .001$).

Financial difficulties. This variable was defined on the EHC as whether the household had experienced long periods of substantial financial difficulty, including difficulty in paying bills. In 207 cases (16.9%), financial problems were reported to have occurred in at least one quarter. For the entire sample, the mean number of quarters in which these problems occurred was 2.32 (*SD* = 6.58). Among only those respondents who reported financial problems for at least one quarter, the mean number of quarters was 13.74 (*SD* = 9.99). The prevalence of financial difficulties in the first 3 years of life (10.6%) was somewhat lower than that in the second 3 years (14.8%).

Parental conflict. Parents reported on the EHC extended periods of serious conflict between cohabitating partners or between a caregiver and a noncohabitating partner. In 263 cases (21.5%), there was at least one quarter when parental conflict occurred. For the whole sample, the mean number of quarters in which conflict occurred was 1.58 (*SD* = 4.59). For those who experienced parental conflict during at least one quarter, the mean number of quarters was 7.37 (*SD* = 7.46). The prevalence of parental conflict was similar for the first (13.6%) and the second 3 years (14.5%).

All the EHC variables were measured by single dichotomous items. The participants were asked to simply respond whether or not a behavior had occurred during the reference period. There was no further probing about the symptoms and extent of the behaviors by the interviewers. Single dichotomous items are generally considered less optimal than linear multiple-item measures (but see e.g. [45-47]). However, multiple-item measures are not practical for application in EHCs since they would have had to be asked for each of the quarters. As a result, they would be very time-consuming, repetitive, and burdensome on the respondent. Separation, maternal depression, financial difficulties, and parental conflict were lagged variables. Parental conflict was measured 3 quarters (9 months) before the quarter in which the aggressive behavior and internalizing problems were measured. Separation was measured 2 quarters (6 months) before problem behavior. Maternal depression and financial difficulties were measured 1 quarter (3 months) before problem behavior. Thus, the occurrence of aggression and internalizing behavior were assessed 6 months after the separation. This lagging procedure was adopted to gain insight into the temporal sequence of events. If separation, maternal depression, financial difficulties, and parental conflict had been measured in the same quarter as the aggression and internalizing behavior, we would not have been sure about the real sequence of events and about their causal direction. Very little is currently known about how long it takes for separation to result in a change in behavior. In the absence of definitive evidence, we chose a time delay of 6 months, because we assumed that the effects of separation on child aggressive and internalizing problem behavior would manifest within this time frame. We note that the period immediately before and after the separation in particular can be characterized as a “period of crisis.” The “crisis model” predicts that the effects of separation on problem behavior are greatest in the short-term and fade over time [20].

After excluding the EHCs completed by fathers and those describing children whose

parents were temporarily absent, died, or those in which the child was raised by a single parent from birth, the final number of cases analyzed was 995. The number of measurement times was 28,096.

Eisner and colleagues [40] investigated the criterion validity of the *z-proso* EHC and found concurrent and discriminant validity of the variables. For example, risk factors such as maternal depression, parental separation, parental conflict, and financial difficulties were correlated with behavioral outcomes in the expected direction, the size-order and relative importance of early risk factors were in line with the previous literature, longer exposure was associated with an added risk, and the likelihood of problematic outcomes was related to cumulative contextual risk. In addition, Murray [48] concluded that overall agreement between the EHC and the regular wave one data ranged between 92% and 96% for household composition. Furthermore, Eisner and colleagues [40] compared data on unemployment from the EHC with city-wide official statistics on quarterly levels of unemployment and found a high correlation (r = .89).

Procedure

Written informed consent for participation was obtained from the parents. The data handling and storage procedures were approved by the data protection officers of the city of Zurich. The interviews included questions about the child's behavior and social development. Computer-assisted personal parent assessments lasting 1 h were conducted at the parents' home. The parent chosen for the interviews was the primary caregiver (usually the mother, 1,152 of the 1,225 cases; we only included interviews by the mother). The interviewers had been intensively trained by the research team, especially in administering the EHC.

Data Analysis

To make optimal use of the data, we utilized a multilevel path model [49, 50] where time-points are clustered within individuals. Multilevel path models separate the variance into

components measured between individuals and components measured within individuals, the latter of which is our main interest. Given the binary nature of the dependent variables, we estimated logistic models using maximum likelihood estimation with robust standard errors in MPlus [51]. Logistic models allow for interpretation of the direct effects in terms of Odds Ratios. The fit indices that are available for these models in MPlus were as follows: Loglikelihood = -19110.045; Scaling correction factor for MLR = 6.299; AIC = 38244.091; BIC = 38343.011; and sample-size adjusted BIC = 38304.876 for aggressive behavior, and Loglikelihood = -21125.104; Scaling correction factor for MLR = 6.646; AIC = 42274.208; BIC = 42373.128; and sample-size adjusted BIC = 42334.9939 for internalizing behavior. Because we did not hypothesize the presence of random effects and did not want to unduly complicate the model, we did not use random slopes in any of the models.

We did not use an explicit model building approach, where different model parts are first estimated separately and the full model is estimated as the final step. Instead, since our model was theoretically driven, we directly estimated the full model as displayed in Figure 1. Our results are presented accordingly.

Results

We present our results in two steps. First, we provide a time sequence of the main study variables, representing the timeline of events surrounding parental separation. Second, we present the effects of separation on the children's aggressive and internalizing behavior.

Time sequence of events

Figure 2 displays the sequence in which the main study variables occurred and thereby provides insight into the process of separation and the development of the key events. The figure shows the average level of aggressive and internalizing problem behavior, maternal depression, parental conflict, and financial difficulties on the EHC. The plots were constructed by first centering the data according to the separation event. The number of

available observations is lower towards both ends of the plot compared to the middle part of the plot. The figure suggests that aggressive and internalizing problem behavior began to increase before separation, peaked around the time of separation, and decreased afterwards. Interestingly, child internalizing behavior showed a slight delay relative to separation, peaking 3 months after separation. In contrast, parental conflict increased substantially before separation, peaked right before and during the quarter of separation, and decreased rapidly directly thereafter. Maternal depression also increased before separation and peaked around the time of separation, but remained at elevated levels for a while thereafter. Financial difficulties increased somewhat leading up to the separation, but reached particularly elevated levels right after the separation. Furthermore, they remained at almost identically high levels for the entire measurement period.

Effects of Separation

Aggressive behavior. Table 1 displays the results for aggressive behavior. As expected, separation in a given quarter increased maternal depression ($OR = 5.71$, $p < .001$) and financial difficulties in the subsequent quarter ($OR = 4.46$, $p < .001$). Parental conflict was found to increase the likelihood of separation in the quarter thereafter ($OR = 24.18$, $p < .001$).

Separation had a direct effect on aggression ($OR = 2.34$, $p < .05$). There was no significant effect of parental conflict ($OR = 2.00$, $p = .138$) or financial difficulties ($OR = 0.89$, $p = .784$). Of the indirect effects, the effect of separation via maternal depression ($p < .05$) but not via financial difficulties ($p = .784$) was significant.

Internalizing behavior. Our findings for internalizing behavior are shown in Table 2. Separation had a direct effect on internalizing behavior ($OR = 1.67$, $p < .05$). Maternal depression ($OR = 3.77$, $p < .001$), financial difficulties ($OR = 1.89$, $p < .05$), and parental conflict ($OR = 1.91$, $p < .01$) also increased internalizing behavior. There was an indirect effect of separation via maternal depression ($p <.001$), but the indirect effect of separation via

financial difficulties was only marginally significant (p = .058).

Exploratory analyses. The same path models as in the main analysis were performed separately for girls and for boys. Coefficients were compared with a z-test. None of the coefficients differed significantly between boys and girls.

Discussion

In this study, we investigated the effects of parental separation on child aggressive and internalizing behavior and the extent to which such effects can be attributed to parental conflict, maternal depression, and financial difficulties. The primary data were collected using the EHC and consisted of information about the first 7 years of the child's life divided into 3-month segments.

Our first main finding resulted from our investigation of the time sequence of the events surrounding separation. Although child problem behavior, maternal depression, and parental conflict all peaked around the time of separation, their developmental process is somewhat different. While parental conflict increased substantially leading up to the time of separation, it decreased dramatically right after. On the other hand, maternal depression remained at elevated levels thereafter, as did child problem behavior. Moreover, the finding that all three increased leading up to the time of separation and decreased thereafter suggests that separation should be seen as a family process rather than as a single event. This pattern was somewhat different for financial difficulties. These increased around the time of separation, but unlike the other variables remained high afterwards.

Our analyses also showed that, according to the parents, the effect of the separation on their children did not last long; both internalizing and aggressive behavior increased up to the time of the separation but leveled off quickly thereafter. This result is surprising in light of prior studies that found longer-term effects of separation (e.g., [52]), but it is consistent with the results of other studies that found the effects of separation to be most apparent in the short

term (e.g., [4, 12, 20]). The pattern observed in our study theoretically supports a "crisis model", in which parental separation is considered to be a temporary stressor that individuals adapt to over time [53]. This model seems to apply not only to the aggressive and internalizing behavior of the child, but also to the explanations for the separation-behavior relationship; recall that parental conflict peaked at the time of separation and decreased quickly thereafter, whereas maternal depression continued to be elevated for a time after the separation but then gradually decreased. Only financial difficulties remained high for a substantial period of time after the separation. This suggests that separation leads to a long-term lack of adequate financial resources in custodial families. This lack of resources may increase children's problem behavior in the longer term, because the economic pressure it causes decreases the quality of parenting [30]. This reasoning may also explain why some studies found long-term effects of separation on child behavior and ours did not.

Our second main finding was that parental separation increased aggressive and internalizing behavior. This effect was not only direct: Separation also led to higher maternal depression, which in turn increased aggressive and internalizing behavior. In contrast, we found no indirect effects of separation via financial difficulties.

Given the hypotheses based on maternal depression, financial difficulties, and parental conflict, the direct effect of separation on aggressive and internalizing behavior was unexpected. We can think of three possible explanations. First, the mechanisms by which parental conflict, maternal depression, and financial difficulties affect child problem behavior may be more complex than we assumed. Second, the children's self-attributed blame for the separation [54] and the stress the children experienced as a result of the separation may contribute to problem behavior. Third, paternal absence may reduce positive and supportive fathering, which has been related to developmental outcomes in their children [55], especially when the mother is less supportive [56]. Paternal absence may also cause lower secure parent-

child attachment [57], and less parental monitoring [58], in turn leading to child problem behavior.

In summary, our study has extended prior research in several novel ways. Compared to previous studies, our use of an EHC provided detailed descriptions of the time sequence of the separation, child problem behavior, and the potential mediators of the two. This methodology allowed us to view parental separation as a process "characterized by a sequence of potentially stressful experiences that begin before physical separation and continue after it" [16], p. 801). Our descriptive results show that aggressive and internalizing behavior increases before separation, as do parental conflict and maternal depression. They also show that the duration of these effects may be limited. Despite several exceptions [5, 7, 11, 17], most of the prior studies that used multiple measurement times to investigate the effects of separation on child problem behavior had only two measurement times, but studies that use more than two are better able to capture the relevant developmental processes. Moreover, because we used an EHC, the measurement times were separated by only 3 months, thereby allowing us to track short-term effects. In addition, we included measures for maternal depression, financial difficulties, and parental conflict; after including these factors, we found that separation continued to directly affect aggressive and internalizing behavior in the children.

There are several limitations to our study. First, because the EHC reports were retrospective they may have been affected by memory bias, thereby underestimating the frequency of aggressive and internalizing behavior. Nonetheless, EHCs are still superior to measure retrospective events compared to standard survey methods in terms of measurement quality [59], and they are particularly well suited to the life events measured in our study. Our study is also among the first who have access to EHC information in relation to separation and child behavior. Because EHCs provide information about events that occur in between the

particular measurement times, they offer a more continuous picture of the developmental process. As mentioned, prior studies by Freedman et al. [43], Caspi et al. [39], and Morris and Slocum [44] have been generally positive about the accuracy of EHCs. Second, EHC variables were measured as dichotomous, single item measures. As mentioned, linear, multiple-item measures were not deemed practical for application in EHCs. Although linear multiple-item measures are generally optimal, recent research has shown that single items are also valid, especially in depression and stress research [45-47]. Third, the EHC information was only collected among parents, and parents may answer the questions about problem behavior in children differently than other informants. Fourth, the EHC ratings of internalizing behavior were unexpectedly higher than those of aggressive behavior. In other studies, externalizing behavior in early and middle childhood was reported to be as frequent or more frequent than internalizing behavior [60-62], although in a German study higher mean scores were reported for anxiety and depression than for aggressive behavior [63]. One reason for this difference might be that reports of internalizing behavior are less subject to social desirability response bias than reports of aggression. Also, comparisons of rates across studies are somewhat problematic because of differences in definitions and the test instruments used. Fifth, we assumed that parental conflict *before* separation affected problem behavior. However, post-separation conflict between parents may also be an important mediator, although our data suggested that parental conflict decreases dramatically after separation. Sixth, we assumed that separation has the same valence across children. However, differences of interpretation may, in turn, lead to differences in adaptation [64]. In future studies it may be useful to examine not only the separation event per se, but also the subjective valence or meaning of the separation for the child. Future studies should also study to what extent vulnerability and resiliency resources (such as temperament) affect children's responses to parental separation [65].

Despite these limitations, our study has extended prior research on the effects of separation on child problem behavior by retrospectively collecting data over multiple short time periods of parental separation and child behavior that also provide information on maternal depression, financial difficulties, and parental conflict. Future process-oriented research on separation that collects detailed data and includes theoretically important mediators are needed to shed further light on the developmental processes affected by parental separation.

Summary

This study investigated the effects of parental separation on aggressive and internalizing problem behavior among 7-year-old children in Zurich, Switzerland. We utilized a novel instrument, the EHC, to collect detailed information on the timing of separation and problem behavior, allowing us to separate events in 3-month periods. We also included measures on maternal depression, financial difficulties, and parental conflict which were expected to explain the relationship between separation and problem behavior. Results showed that this was indeed the case: besides a direct effect of separation on child problem behavior, the relationship was also mediated by maternal depression. However, results suggested that the relationship existed primarily in the short-term. The findings highlight the importance of process-oriented research on separation that utilizes detailed information on the timing of separation and problem behavior. The findings also point to the importance of collecting information on key mediators.

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Table 1

Effects of Separation on Children's Aggressive Behavior

	Odds Ratio	Unstandardized coefficient	SE
Effects on mediators			
Separation to maternal depression	5.71	1.74**	0.18
Separation to financial difficulties	4.46	1.50**	0.17
Parental conflict to separation			
Conflict to separation	24.18	3.19**	0.16
Direct effects on aggression			
Maternal depression to aggression	2.34	0.85*	0.41
Financial difficulties to aggression	0.89	-0.11	0.41
Parental conflict to aggression	2.00	0.70	0.47
Separation to aggression	2.34	0.85*	0.34
Indirect effects on aggression			
Separation to maternal depression to aggression		1.48*	0.71
Separation to financial difficulties to aggression		-0.17	0.61
Number of person-quarters		28096	
Number of persons		995	

*p <. 05. **p < .01. Two-tailed.

Table 2

Effects of Separation on Children's Internalizing Behavior

	Odds Ratio	Unstandardized coefficient	SE
Effects on mediators			
Separation to maternal depression	5.73	1.75**	0.18
Separation to financial difficulties	4.47	1.50**	0.17
Parental conflict to separation			
Conflict to separation	24.18	3.19**	0.16
Direct effects on internalizing behavior			
Maternal depression to internalizing behavior	3.77	1.33**	0.26
Financial difficulties to internalizing behavior	1.89	0.64*	0.32
Parental conflict to internalizing behavior	1.91	0.65**	0.24
Separation to internalizing behavior	1.67	0.51*	0.24
Indirect effects on internalizing behavior			
Separation to maternal depression to aggression		2.32**	0.53
Separation to financial difficulties to aggression		0.95	0.50
Number of person-quarters		28096	
Number of persons		995	

*p <. 05. **p < .01. Two-tailed.

Figure Caption.

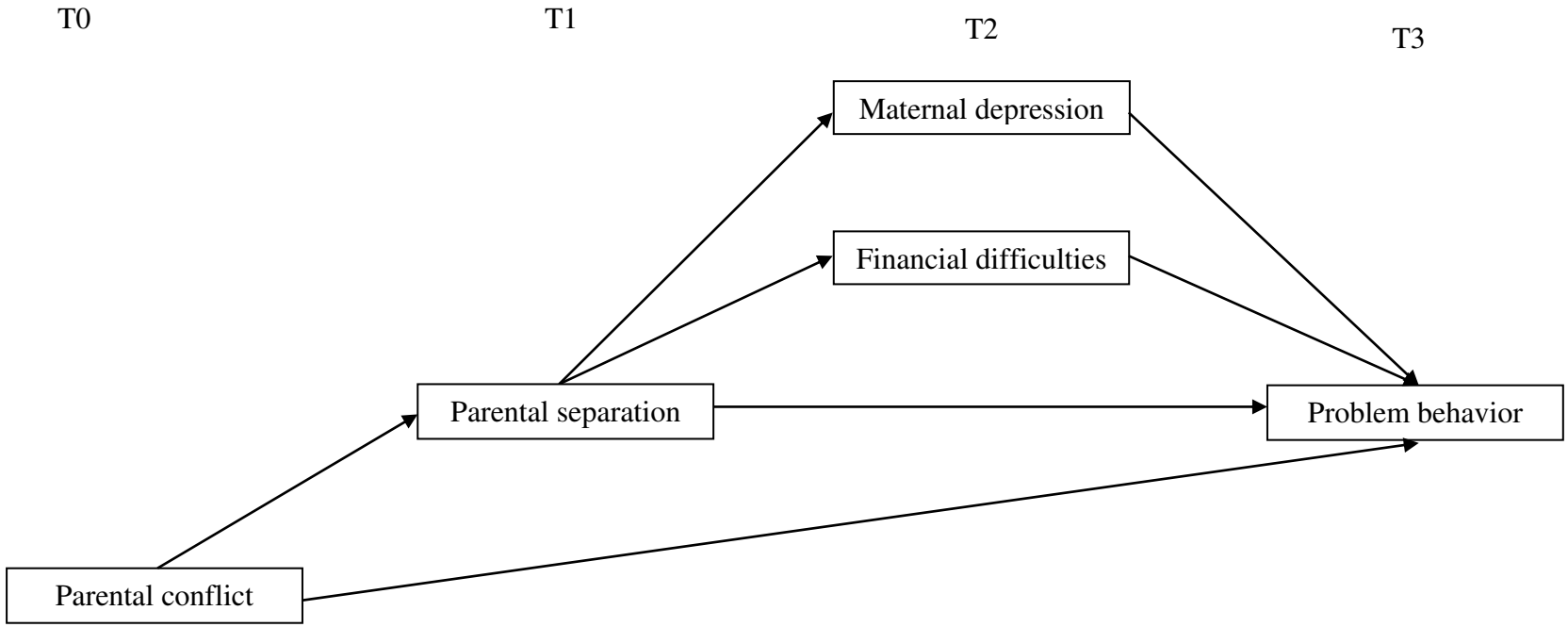
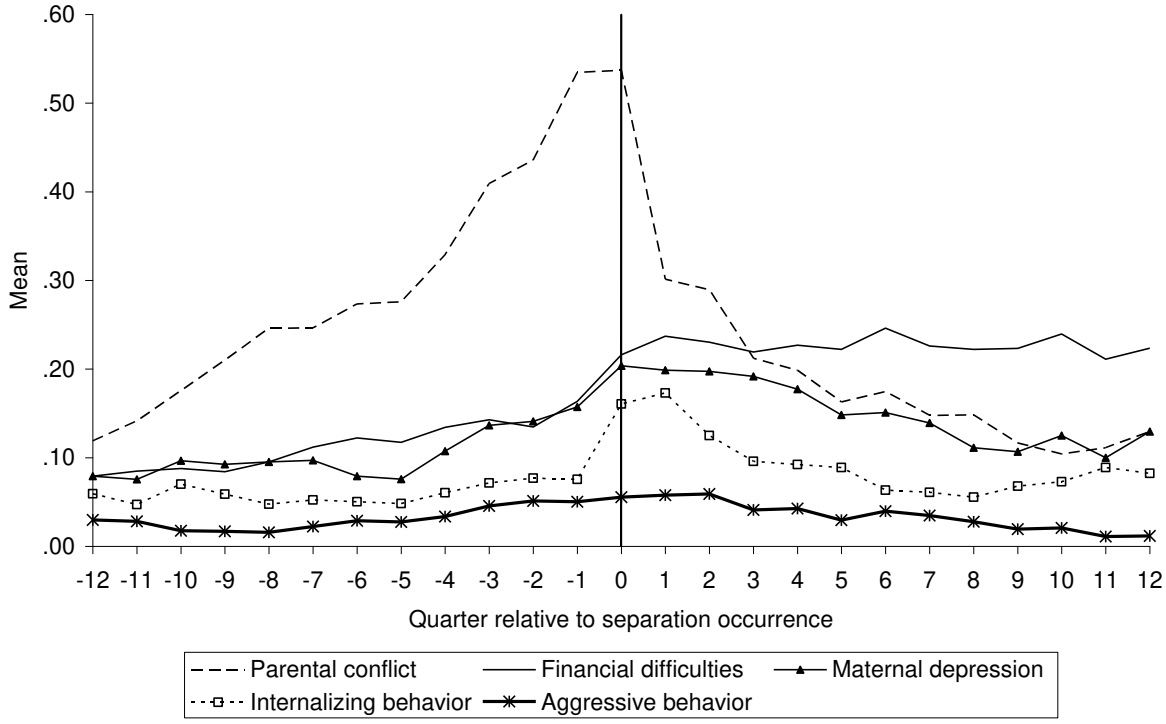


Figure 1. Path model for parental separation and problem behavior



Note. Separation occurs when the "quarter relative to separation occurrence" (x-axis) is zero.

Figure 2. Time sequences for the effects of separation on maternal depression, financial difficulties, parental conflict, and children's aggressive and internalizing behavior